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[Continued on next page]

(54) Title: PLANTS HAVING MODIFIED GROWTH CHARACTERISTICS AND METHOD FOR MAKING THE SAME

Type 1

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** * * *
A1MT1a NAGSNGGCGS GSGGSGGCGS KSNV ..... NRCG DNGGCGGCGS GSGGSGGCGS
A1MT1b NAGSNGGCGS GSGGSGGCGS KSNV ..... NRCG DNGGCGGCGS GSGGSGGCGS
A1MT1c NAGSNGGCGS GSGGSGGCGS KSNV ..... NRCG DNGGCGGCGS GSGGSGGCGS
O1MT1a NS...GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
P1MT1 NS...GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
M1MT1 NS...GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS

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Type 2

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** * * *
A1MT2a NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT2b NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT2c NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
O1MT2 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
P1MT2 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
M1MT2 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS

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Type 3

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** * * *
A1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
O1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
P1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
M1MT3 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS

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Type 4

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** * * *
A1MT4a NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT4b NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
A1MT4c NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
O1MT4 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
P1MT4 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS
M1MT4 NSGCGGCGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS GSGGSGGCGS

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(57) Abstract: The present invention concerns a method for modifying the growth characteristics of plants by modulating expression in a plant of a nucleic acid sequence encoding a metallothionein and/or modulating activity in a plant of a metallothionein. The invention also relates to transgenic plants having modified growth characteristics, which plants have modulated expression of a nucleic acid encoding a metallothionein.

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PCT/EP2004/050519

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A01H5/00 C12N15/82 A01H5/10		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 C12N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, BIOSIS, WPI Data, EMBL		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/36084 A (AGRICOLA TECH INC) 20 August 1998 (1998-08-20)	1-7, 9-11, 14-22
Y	page 2, line 11 - line 23 page 9, line 7 - line 14 page 35, line 6 - page 37, line 12	8,23,24
X	LUCCA PAOLA ET AL: "Approaches to improving the bioavailability and level of iron in rice seeds" JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE, vol. 81, no. 9, July 2001 (2001-07), pages 828-834, XP001183265 ISSN: 0022-5142	1,4-7,9, 10,14-20
Y	page 832, right-hand column, last paragraph - page 833, left-hand column, paragraph 3	8,23,24
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*Z* document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search <div style="text-align: center; font-weight: bold;">20 September 2004</div>		Date of mailing of the international search report <div style="text-align: center; font-weight: bold;">07/10/2004</div>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <div style="text-align: center; font-weight: bold;">Loubradou, G</div>

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2004/050519

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 7 November 1991 (1991-11-07), TAKAHASHI: "A. thaliana AtMT-1 mRNA for metallothionein-like protein" XP002297021 Database accession no. X62818 the whole document	11-13 8,23,24
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A	PATER DE B S ET AL: "THE PROMOTER OF THE RICE GENE GOS2 IS ACTIVE IN VARIOUS DIFFERENT MONOCOT TISSUES AND BINDS RICE NUCLEAR FACTOR ASF-1" PLANT JOURNAL, BLACKWELL SCIENTIFIC PUBLICATIONS, OXFORD, GB, vol. 2, no. 6, 1992, pages 837-844, XP000907326 ISSN: 0960-7412 cited in the application abstract	
A	COBBETT CHRISTOPHER ET AL: "Phytochelatins and metallothioneins: roles in heavy metal detoxification and homeostasis." ANNUAL REVIEW OF PLANT BIOLOGY. 2002, vol. 53, 2002, pages 159-182, XP002297019 ISSN: 1543-5008 cited in the application the whole document	
A	SUH M C ET AL: "Cadmium resistance in transgenic tobacco plants expressing the Nicotiana glutinosa L. metallothionein-like gene." MOLECULES AND CELLS. 31 DEC 1998, vol. 8, no. 6, 31 December 1998 (1998-12-31), pages 678-684, XP009036622 ISSN: 1016-8478 the whole document	
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International Application No

PCT/EP2004/050519

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KAERENLAMPI S ET AL: "Genetic engineering in the improvement of plants for phytoremediation of metal polluted soils" ENVIRONMENTAL POLLUTION, BARKING, GB, vol. 107, no. 2, 2000, pages 225-231, XP002287818 ISSN: 0269-7491 the whole document	
A	THOMAS JOHN C ET AL: "Yeast metallothionein in transgenic tobacco promotes copper uptake from contaminated soils." BIOTECHNOLOGY PROGRESS, vol. 19, no. 2, 21 November 2002 (2002-11-21), pages 273-280, XP002297020 ISSN: 8756-7938 page 276, right-hand column, paragraph 4	
A	EVANS KATHERINE M ET AL: "Expression of the metallothionein-like gene PsMT-ALPHA in Escherichia coli and Arabidopsis thaliana and analysis of trace metal ion accumulation: Implications for PsMT-ALPHA function" PLANT MOLECULAR BIOLOGY, vol. 20, no. 6, 1992, pages 1019-1028, XP009036607 ISSN: 0167-4412 the whole document	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9836084	A	20-08-1998	AU WO	6152998 A 9836084 A2	08-09-1998 20-08-1998



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